

## ASSESSMENT OF NUTRITIONAL STATUS OF THE PATIENTS

### SUFFERING FROM GOUT IN KASHMIR

TASHI DOLKAR & UZMA ALI

Research Scholar at Institute of Home Science, University of Kashmir, India

#### ABSTRACT

*The present study was aimed to assess the nutritional status of the patients suffering from Gout in Kashmir. To gather information from 50 samples, Questionnaire was used. The sampling was conducted in OPD of SMHS hospital, Srinagar. The result revealed that among the studied sample 64% were males whereas females constituted 36%. Gout seen more among in males as compared to females. Gout is the most common cause of inflammatory arthirirts in men. The commonest symptoms were pain in joints and redness of joints. The result also showed that majority of patients were found in the age group 50-60years. Majority of the studied sample were non vegetarian and were consuming meat. 50% of the patients were found to obese. Clinical signs as loss of lusture in hair, dry and rough skin, brittle hair, spotted and pale yellow teeth, bleeding gums and rough lips were found in small percentage of study sample whereas majority showed no clinical signs of malnutrition. Dietary intake of calories, proteins and iron was lower than the ICMR recommendations for majority of the studied sample.*

**KEYWORDS:** Urate Crystals, Disease, Elderly, Dietary Habits & Food

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#### INTRODUCTION

Gout is a disease that results from an overload of uric acid in the body. This overload of uric acid leads to the formation of tiny crystals of urate that deposit in the body, especially the joints. Urate is a chemical in the blood. It is made in the body when certain foods are digested. It is usually in the form of a harmless liquid that passes out form the body through urine. But in some people, the amount of urate in the blood builds up. It starts to form tiny crystals which can collect in a joint. The crystals can cause inflammation and pain. The joint inflammation is precipitated by deposits of uric acid crystals in the joint fluid (synovial fluid) and joint lining (Synovial lining). Intense joint inflammation occurs as white blob cells engulf the uric acid crystals and chemical messengers of inflammation are released, causing pain, heat and redness of the joint tissue. Chronic gout leads to deposits hard lumps of uric acid in and around the joints and may cause joint destruction, decreased kidney function, and kidney stones. Gout may be classified into two types known as Primary and Secondary gout. Primary refers to cases in which the underlying biochemical defect causing hyperuricemia is not known (Harsh, 2006). Secondary gout is due to various diseases causing increased synthesis or decreased excretion of uric acid which is observed in various cancers (Leukemia, polycythemia etc). Primary gout accounts for about 90% of gout cases whereas secondary type of gout accounts for only 10% of gout cases (Satyanarayana & Chakrapani, 2006). Gout is caused by too much uric acid in the blood. Most of the time, having too much uric acid is not harmful. Many people with high levels of uric acid in blood never get gout. But when uric acid levels in the blood are too high, the uric acid may form hard crystals in joints. Obesity, drinking too much alcohol, eating too much meat & fish,

certain illnesses like heart disease, high blood pressure, diabetes and high cholesterol and also some medicines, such as diuretics (water pills) can bring on gout (Atkinson et.al,2004). The signs and symptoms of gout are intense joint pain, lingering discomfort and inflammation & redness. Intense joint pain usually affects the large joint of big toe, but it can occur in feet, ankles, knees, hands and wrists. The pain is likely to be most severe within the first 12 to 24 hours after it begins. Lingering discomfort also occur which may last from a few days to a few weeks. Later attacks are likely to last longer and affect more joints. Inflammation and redness also occurs in the affected joints (Springhouse, 2005). People with gout develop complications such as recurrent gout, advanced gout and kidney stones. Under recurrent gout some people may never experience gout signs and symptoms again. But others may experience gout several times each year. Recurrent gout leads to advanced gout. Recurrent gout is a condition in which urate crystals form under the skin in nodules called Tophi. Tophi usually aren't painful, but they can become swollen and tender during gout attacks. And the most severe condition is the formation of kidney stones. Urate crystals may collect in the urinary tract of people with gout, causing kidney stones. Medications can help to reduce the risk of kidney stones (Snaith, 1995). Approximately 5 million people in the U.S.A suffer from gout. Gout is nine times more common in men than in women. It attacks males after puberty, with a peak age of 75. In women, gout attacks usually occur after menopause (Shiel, 2004). Gout is caused by uric acid crystallization in joints which causes an immune response. These uric acid crystals are seen as invaders by immune system which causes it to respond. This cause immune system to always be in a heightened state of alert and it can cause inflammation in body and can cause many deadly diseases (Lin et al, 2000). Obesity, since the Hippocratic era, is associated with the gout. Lifestyle factor plays an important role in the cause of disease. Gouty men have long been reported to suffer high rates otatherosclerosis and hypertension. While stroke and coronary diseases are common causes of death among the gouty patients. Diabetes is associated with gout. Gout was associated with a 60% increased risk of Coronary Heart Disease (CHD) in men. Gout is associated with several features that tend to reduce survival (such as Obesity) and has recently been shown to increase the risk of Acute Myocardial Infarction (Choi et al, 2008).

## REVIEW OF RELATED LITERATURE

According to **Wallace (2004, 1582-7)**, prevalence of gout/ or hyperuricemia in the overall study population increased during the last 10 years period. When stratified by age, there were increases in prevalence among groups over the age of 65 years in both the sexes. Although gout prevalence increased in both sexes over the 10 years period, men still had most of the burden of disease. In younger than 65, men had four times higher prevalence than women (4:1), but in the older age groups (>65), gender gap narrowed to women to every 3 men with gout/ or hyperuricemia (3:1 ratio).

Thorough study carried out by **Choi H K et.al. (2004, 390-395)** showed that the consumption of meat, particularly red meat, significantly increased risk of gout, and that consumption of all types of sea foods like tuna fish, lobster, shrimp increased the risk of gout. Notably, no increased risk was seen with the consumption of purine rich vegetables, which include peas, beans, mushrooms, cauliflower and spinach.

According to **Mahajan (2007, 49-51)**, gout is an important cause of arthritis and the prevalence is on the increase. The incidence of gout in India varies in population with an overall prevalence of less than 1 to 15.3%. Gout once called the "disease of kings", is also seen in women, especially after menopause. The male female ratio changes as estrogen status changes. Normally male: female ratio is 7:1 to 9:1, women before menopause is female> male, in the older age groups above 65 years- male: female- 3:1 ratio and after 80 years of age females are compared to males. Similarly study carried out by **Marcello et.al. (2007)**, revealed that elderly onset gout, defined as a disease with onset at the age 65 years or over,

shows relevant epidemiological, clinical and therapeutic differences from the typical middle age form. The main differences are the more frequent chronic Polyarticular onset with hand involvement, the unusual localization of tophi on osteoarthritis (O.A) nodes, the increased female/male ratio and the frequent association with drugs that decrease renal urate excretion. EOG has recently been confirmed as the most common inflammatory arthropathy in older people.

Researchers suggest that taking vitamin C supplements at the levels of less than 2000mg/day may be a safe effective way to prevent gout. Vitamin C significantly decreases the uric acid levels (**Jennifer Warner 2009, 524-529**).

As the disease have significant impact on human nutrition. Thus, the study was conducted in keeping the view following objectives:

- To find out the consumption of foods and lifestyle known to cause gout.
- To study the dietary intake and nutrients to the gouty patients (using 24 hour recall and food frequency method) and to compare the results with standards. (ICMR).
- To find out the nutritional status (using Anthropometric Measurements and clinical Assessment) of the patients suffering from the gout.

## METHODOLOGY

In order to find out the health and nutritional status to the patients suffering from gout, a sample size of 50 including both male and female from any age group were selected randomly. The venue for sampling was OPD of SKIMS & SMHS Hospital. In order to collect information from the patients an interview cum questionnaire schedule was used.

The questionnaire was divided into different sections in order to collect the required information. The first section gave the general information about the patient in terms of name, gender, age, residential area, occupation etc. The next sections included general habits & food habits of the patient. General habits reveal the information about the lifestyle of the patient and food habits gave the information about the dietary pattern of the patient. The next section included the co-relation between the diet & the management and progression of the disease. The fifth section provided information about the anthropometric measurements of the selected sample. Anthropometric measurements included the information regarding the anthropometric measurements like height, weight and Body Mass Index (BMI) of the patients. Weight of the patients was recorded in kilograms with the help of a weighing scale. Height of the patient was recorded in centimeters using a measuring tape. The Body Mass Index (BMI) of the patients was calculated on the basis of the height & weight of the patient by using the formula:

$$\text{BMI} = \frac{\text{Wt (kgs)}}{\text{Ht (m)}^2}$$

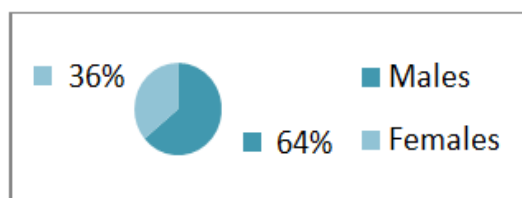
The next section was clinical evaluation which revealed the information regarding the signs and symptoms of various deficiency diseases. And the last section reveals the dietary assessment. In this section information regarding the nutritional intake of the patients was gathered by using method 24 hour recall Method.

## RESULTS

**Table 1: Distribution of Sample as Per Age**

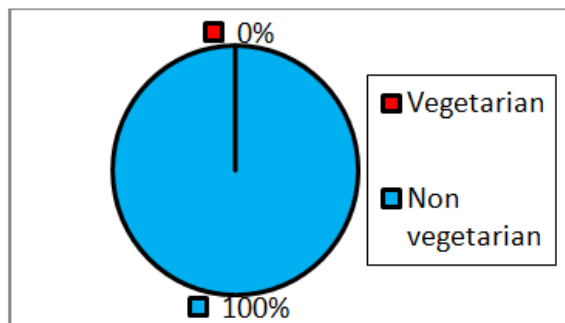
Age (In Years)	No	%
30-40	4	8
40-50	9	18
50-60	20	40
60-70	15	30
70-80	1	2
80-90	1	2
<b>Total</b>	<b>50</b>	<b>100</b>

Table 1 revealed that age-wise distribution of the sample and the results clearly indicate that gout is more prevalent in the age group of 50-60 and constituted 40%.



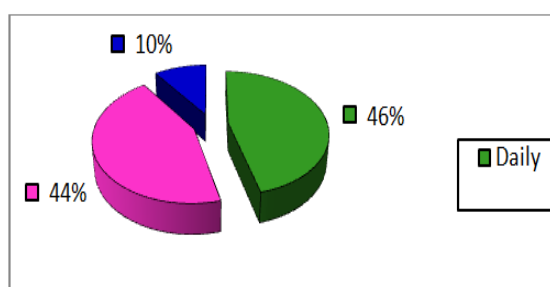
**Figure 1: Distribution of Samples as Per Gender**

Figure 1: revealed that among the studied sample 64% were males whereas females constituted 36%.



**Figure 2: Distribution of Sample According to Eating Habits (Before Diagnosis)**

Figure 2 revealed the type of diet consumed by the studied sample and the result showed that 100% of the samples were non-vegetarians.



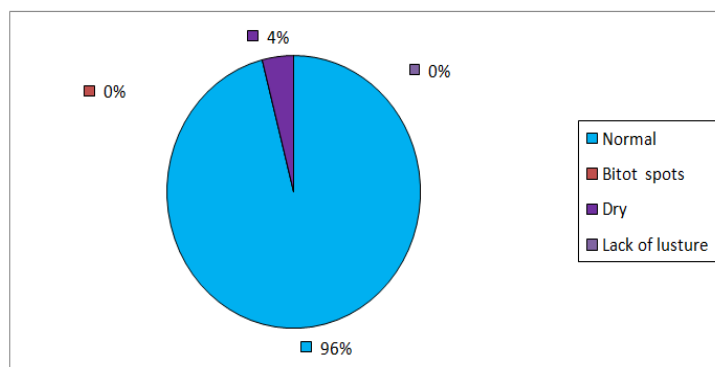
**Figure 3: Distribution of Sample as Per the Habit of Consuming Meat (Before Diagnosis)**

The distribution of the sample as per the habit of consuming meat is represented in figure 3. The result show that 46 % were consuming meat daily, 44% weekly and 10% fortnightly.

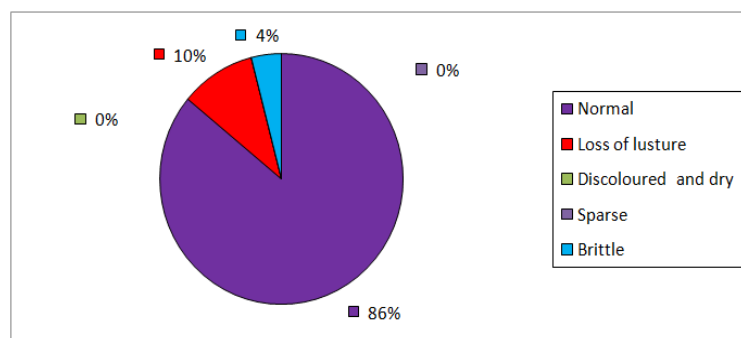
**Table 2: Distribution of Sample as Per Levels of Uric Acid**

Uric Acid (mg/dl)	No	%
6-7	6	12
7-8	24	48
8-9	13	26
9-10	6	12
Above 10	1	2
<b>Total</b>	<b>50</b>	<b>100</b>

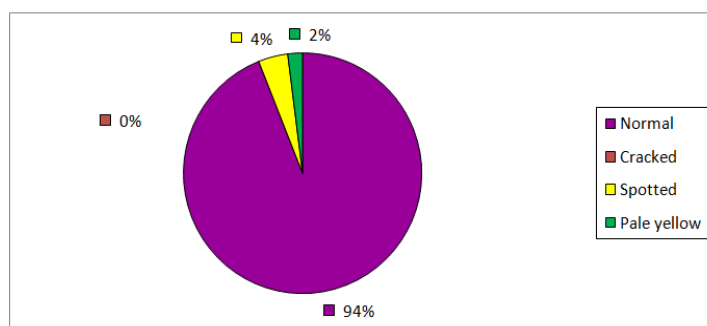
As far as levels of uric acid are concerned 48% were in the range of 7-8mg/dl, 26% were in the range of 8-9mg/dl, 12% were in the ranges of 6-7 and 9-10mg/dl. Only 2% were having uric acid above 10mg/dl



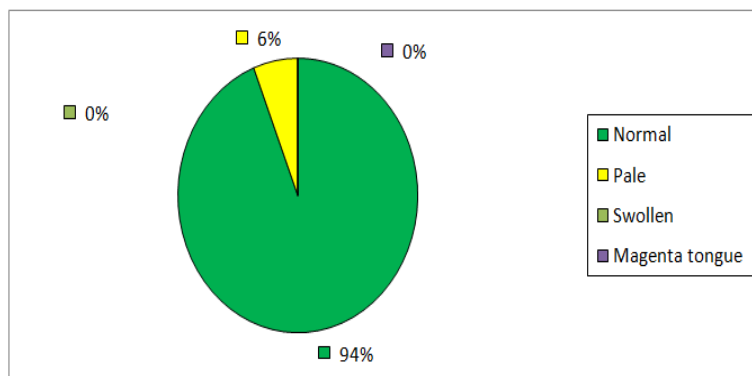
**Figure 4: Distribution of Sample as Per the Clinical Symptom (Eyes)**



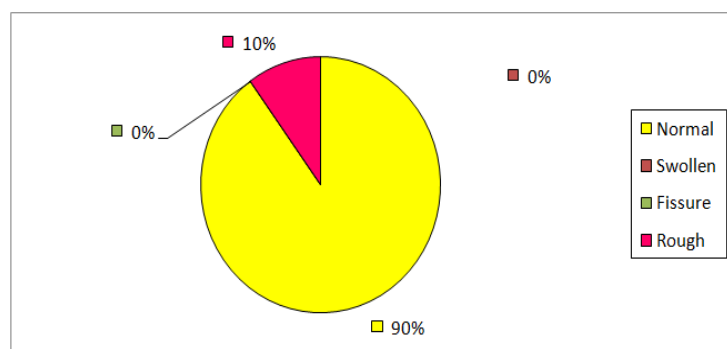
**Figure 5: Distribution of Sample as Per the Clinical Symptom (Hair)**



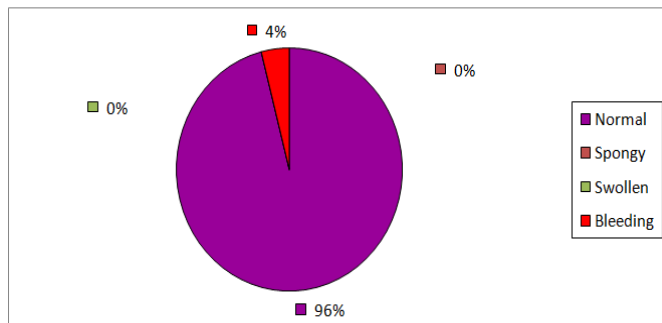
**Figure 6: Distribution of Sample as Per the Clinical Symptom (Teeth)**



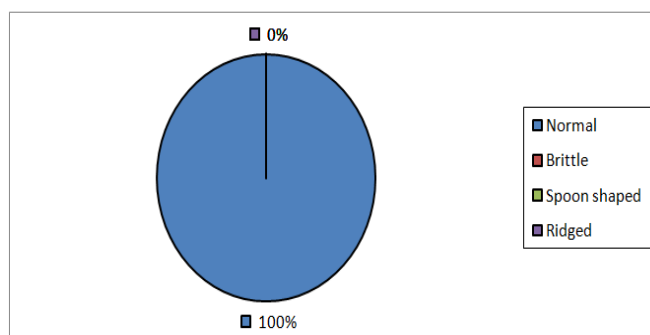
**Figure 7: Distribution of Sample as Per the Clinical Symptom (Tongue)**



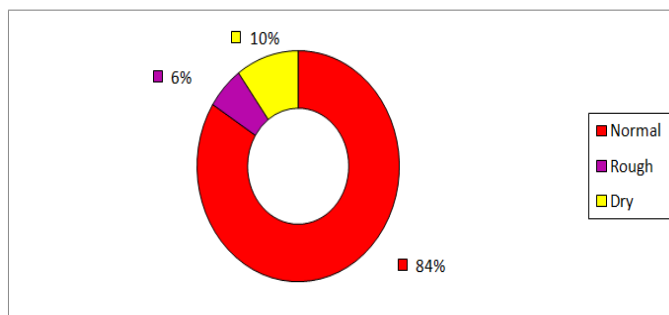
**Figure 8: Distribution of Sample as Per the Clinical Symptom (Lips)**



**Figure 9: Distribution of Sample as Per the Clinical Symptom (Gums)**



**Figure 10: Distribution of Sample as Per the Clinical Symptom (Nails)**



**Figure 11: Distribution of Sample as Per the Clinical Symptom (Skin)**

Figure 4 to figure 11 showed that common signs of malnutrition found in the study group were dry eyes(4%), loss of lusture (10%) and brittle hair (4%). 4% of the studied sample were having spotted teeth, 2% had pale yellow teeth, 6% had pale tongue, rough lips (10%) and bleeding gums (4%). Nails were found to be normal in 100% of the studied sample. 10% and 6% were having dry skin and rough skin respectively.

## DIETARY ASSESSMENT

This section revealed the information regarding the nutrient intake of patients suffering from gout and the results are presented in table 3 to 7.

**Table 3: Consumption of Calories per Day (24 Hour Food Recall) RDA for Calories (kcal/day): Males (Moderate Worker) Females (Moderate Worker)**

AGE GROUP (IN YEARS)	MALES			FEMALES		
	MEAN INTAKE	STANDARD DEVIATION	DEVIATION FROM ICMR	MEAN INTAKE	STANDARD DEVIATION	DEVIATION FROM ICMR
30-40	74.5	---	+14.5	55.94	20.91	+5.94
40-50	59.6	9.1	-0.4	55.2	11.06	+5.2
50-60	49.35	9.28	-10.6	49.18	11.26	-0.82
60-70	48.9	9.80	-11	70.16	8.75	+20.16
70-80	---	---	---	47.2	---	-2.8
80-90	47.74	---	-12.3	---	---	---
AVERAGE	56.01	9.39		55.53	12.99	
COEFFICIENT OF VARIATION	16.76			23.39		

2875

2225

**Note:** Mean intake has been compared with RDA of ICMR with respect to age and gender.

**Source:** Source: Gopalan, C; Rama & Balasubramaniam, SC (1994), "Nutritive Value of Indian Foods". National Institute of Nutrition, Hyderabad.

Table 3 depicts that age and gender wise distribution of studied sample as per the intake of calories. The results showed that the mean intake of calories in all age groups was deviating negatively from RDA's of ICMR except for males in age group 30-40 years. The highest negative deviation (-1729.61) in males was found in age group 80-90 years and

lowest negative deviation (-887.1) was found in age group 40-50 years. In females highest negative deviation (-499) was found in age group 50-60 years and lowest negative deviation (-116) was found in age group 40-50 years.

**Table 4: Consumption of Proteins per Day (24 Hour Food Recall) RDA for Proteins (Gms/Day): RDA for Protein is 60 Gm/Day for Both the Sexes**

AGE GROUP (IN YEARS)	MALES			FEMALES		
	MEAN INTAKE	STANDARD DEVIATION	DEVIATION FROM ICMR	MEAN INTAKE	STANDARD DEVIATION	DEVIATION FROM ICMR
30-40	74.5	---	+14.5	55.94	20.91	+5.94
40-50	59.6	9.1	-0.4	55.2	11.06	+5.2
50-60	49.35	9.28	-10.6	49.18	11.26	-0.82
60-70	48.9	9.80	-11	70.16	8.75	+20.16
70-80	---	---	---	47.2	---	-2.8
80-90	47.74	---	-12.3	---	---	---
AVERAGE	56.01	9.39		55.53	12.99	
COEFFICIENT OF VARIATION	16.76			23.39		

**Note:** Mean intake has been compared with RDA of ICMR with respect to age and gender.

**Source:** Gopalan, C; Rama & Balasubramaniam, SC (1994), "Nutritive Value of Indian Foods". National Institute of Nutrition, Hyderabad.

The age and gender wise distribution of studied sample as per the intake of proteins is presented in table 4. The result showed that average intake of proteins was deviating negatively as well as positively from RDA's of ICMR for both males and female. Highest negative deviation (-12.3) in males was found in age group 80-90 years and lowest negative deviation (-0.4) in age group 40-50 years. In female highest positive deviation (+20.16) was found in age group 60-70 years, and lowest positive deviation (+5.2) was found in age group 40-50 years.

**Table 5: Consumption of Fats per Day (24 Hour Food Recall)**

AGE GROUP (IN YEARS)	MALES			FEMALES		
	MEAN INTAKE	STANDARD DEVIATION	DEVIATION FROM ICMR	MEAN INTAKE	STANDARD DEVIATION	DEVIATION FROM ICMR
30-40	27.6	---	+7.6	43.29	22.98	+23.29
40-50	37.15	11.69	+25.55	37.38	5.99	+17.38
50-60	32.13	8.89	+12.13	27.46	5.09	+7.46
60-70	32.2	6.56	+12.2	32.6	8.11	+12.2
70-80	---	---	---	33.04	---	+13.04
80-90	48.02	---	+28.02	---	---	---
AVERAGE	35.42	9.04		34.67	10.54	
COEFFICIENT OF VARIATION	25.52			30.40		

RDA for fats (gms/day): RDA for Fats is 20 gm/day for both the sexes.



**Note:** Mean intake has been compared with RDA of ICMR with respect to age and gender.

**Source:** Gopalan, C; Rama & Balasubramaniam, SC (1994), "Nutritive Value of Indian Foods". National Institute of Nutrition, Hyderabad.

The age and gender wise distribution of studied sample as per the intake of fat is presented in table 5. The result showed that average intake of fat was deviating positively from RDA's of ICMR in all age groups for both males and females. Highest positive deviation (+28.02) in males was found in age group 80-90 years and lowest positive deviation (+7.6) in age group 30-40 years. As far as females are concerned highest positive deviation (+23.29) was found in age group 30-40 years, and lowest positive deviation (+12.2) was found in age group 60-70 years.

**Table 6: Consumption of Iron per Day (24 Hour Food Recall)**

AGE GROUP (IN YEARS)	MALES			FEMALES		
	MEAN INTAKE	STANDARD DEVIATION	DEVIATION FROM ICMR	MEAN INTAKE	STANDARD DEVIATION	DEVIATION FROM ICMR
30-40	8.67	---	-19.33	12.87	4.74	-17.13
40-50	11.55	3.015	-16.45	24.09	4.29	-5.91
50-60	10.76	1.93	-17.24	9	1.64	-21
60-70	10.2	2.13	-17.8	9.62	0.127	-20.38
70-80	---	---	---	15.44	---	-14.56
80-90	12.97	---	-15.03	---	---	---
AVERAGE	10.83	2.35		14.20	2.69	
COEFFICIENT OF VARIATION	21.69			18.94		

RDA for Iron (mg/day): Males (Moderate Worker) Females (Moderate Worker)

28 30

**Note:** Mean intake has been compared with RDA of ICMR with respect to age and gender.

**Source:** Gopalan, C; Rama & Balasubramaniam, SC (1994), "Nutritive Value of Indian Foods". National Institute of Nutrition, Hyderabad.

The age and gender wise distribution of studied sample as per the intake of iron is presented in table 6. The result showed that mean intake of iron was deviating negatively from RDA's of ICMR in all age groups for both males and females. Highest negative deviation (-19.33) in males was found in age group 30-40 years and lowest negative deviation (-15.03) in age group 80-90 years. In females highest negative deviation (-20.28) was found in age group 60-70 years and lowest negative deviation (-5.91) was found in age group 40-50 years.

**Table 7: Consumption of Vitamin c per Day (24 Hour Food Recall)**

AGE GROUP (IN YEARS)	MALES			FEMALES		
	MEAN INTAKE	STANDARD DEVIATION	DEVIATION FROM ICMR	MEAN INTAKE	STANDARD DEVIATION	DEVIATION FROM ICMR
30-40	88.7	---	+48.7	41.8	20.41	+1.8
40-50	104.08	54.52	+64.08	130.7	63.36	+90.7
50-60	133.9	45.23	+93.9	237.8	38.57	+197.8
60-70	125.1	70.35	+85.1	57.3	42.56	+17.3
70-80	---	---	---	91	---	+51
80-90	100	---	+60.8	---	---	---
AVERAGE	110.51	56.7		---	41.22	
COEFFICIENT OF VARIATION	51.30			36.90		

RDA for Vitamin C (mcg/day):

RDA for Vitamin C is 40 mcg/day for both the sexes.

**Note:** Mean intake has been compared with RDA of ICMR with respect to age and gender.

**Source:** Gopalan, C; Rama & Balasubramaniam, SC (1994), "Nutritive Value of Indian Foods". National Institute of Nutrition, Hyderabad.

The age and gender wise distribution of studied sample as per the intake of vitamin C is presented in table 7. The result showed that mean intake of vitamin C was deviating positively from RDA's of ICMR in all age groups for both males and females. Highest positive deviation (+85.1) in males was found in age group 60-70 years and lowest positive deviation (+48.7) in age group 30-40 years. In females positive deviation (+197.8) was found in age group 50-60 years and lowest positive deviation (+1.8) was found in age group 30-40 years.

## RESULTS

The result showed that majority of patients were found in the age group 50-60 years. Gout is the most common cause of inflammatory arthritis in men. Study showed that gout was found to be more common in men. The commonest symptoms were pain in joints and redness of joints. Majority of the studied sample were consuming meat. 50% of the patients were found to be obese. Clinical signs as loss of lusture in hair, dry and rough skin, brittle hair, spotted and pale yellow teeth, bleeding gums and rough lips were found in small percentage of study sample whereas majority showed no clinical signs of malnutrition. Dietary intake of calories, proteins and iron was lower than the ICMR recommendations for majority of the studied sample.

## CONCLUSIONS

- Among the study group majority were males.
- Gout was found to be more common among elderly people.

- Consumption of meat & fried foods daily was found to be one of the reasons for causing gout.
- Pain in joints and redness of joints was found to be the most common associated problem present in majority of the studied sample.
- 50% of the studied sample had normal BMI and 50% was found to be obese.
- 88% of the studied samples were of the opinion that gout can be treated by both drugs and diet and 12% were of the opinion that it can be controlled by drugs only.
- Intake of calories, iron and proteins was found to be lower than the ICMR recommendations whereas intake of fats and vitamin C was found to be higher than the recommendations of ICMR.

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